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WISC-R PROFILE ANALYSIS IN DIFFERENTIATING LEARNING DISABLED FROM EMOTIONALLY DISTURBED CHILDREN

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The Wechsler Intelligence Scale for Children-Revised (Wechsler, 1974) (WISC-R) has replaced the Wechsler Intelligence Scale for Children (Wechsler, 1949) as one major instrument for assessing the intellectual functioning of school-age children. Studies have been conducted which provide insight into the revised battery (Anderson, Kaufman, & Kaufman, 1976; Kaufman, 1976a, 1976b; Vance, Gaynor, & Coleman, 1976; Vance & Hankins, 1978; Vance, Hankins, & McGee, 1979, in press; Vance, Hankins, McGee, & Engin, 1978; Vance & Wallbrown, 1977). For years practitioners have been interpreting the meaning of differences between Verbal and Performance IQs obtained by an individual on the WISC. It is common to hear practitioners speak of a great deal of scatter in a child's protocol, and often to consider the high degree of scatter to be related to the individual's presenting symptoms. For instance, Wechsler (1944) observed that the adolescent psychopath characteristically had a higher Performance than Verbal IQ. The usefulness of a differential subtest patterning as an aid in diagnosing various clinical groups has been suggested frequently since the 1930's. The WISC-R like its predecessor, the WISC, has proved to be a popular instrument for the assessment of learning disabilities and emotional disturbances primarily because of the format of the scale, which provides individual subtests, opportunity for behavior observation, and Verbal-Performance Scale IQ. However, it is suspected that the continual search for a specific diagnostic pattern, that will discriminate learning

disabled and emotionally disturbed from other normal children, is a relatively fruitless task, and a single clearcut pattern that is characteristic of these children is not expected to emerge. Intellectual patterning in itself should not be a basis for assigning children to classes for the brain-damaged or for the emotionally disturbed.

Learning Disability

One clinical group which has been subject to vigorous research with the WISC/WISC-R is the learning disabled. This group of children and youth has been a most popular topic as indicated by the prolification of journal articles that appeared between 1955 and 1978 in professional journals (over 1200 articles, almost two-thirds of which involved the WISC/WISC-R). The irregular performance of these children on various tests of intelligence has been of interest to psychologists since the beginning of the learning disability movement. Again the usefulness of differential WISC subtest patterns and Verbal-Performance discrepancies in the diagnosis of learning disabilities has been implied frequently since 1950 and became faddish in the 1960's. Literature suggests uneven patterns of performance on these children on the WISC. Many of these studies, such as Landrum (1963), Wells (1970), Rourke, Young, and Flewelling (1971), are difficult to evaluate because of the criteria employed to select children have differed among investigators. The results of scatter patterns and Verbal-Performance discrepancies in the area of diagnosis are often misleading and confusing. Indeed, the results of one investigator may be directly contradictory to the conclusions of another (Beck & Lam, 1955).

Bannatyne (1968) suggested for the purposes of identifying children with dyslexia the recategorizing of WISC scaled scores into Spatial, Conceptual, and Sequential categories. The suggested Spatial score was

derived from three performance subtest scaled scores (Object Assembly, Block Design, and Picture Completion) which usually involves the ability to manipulate objects perceptually, either concretely or symbolically. Comprehension, Similarities, and Vocabulary composed the Conceptual score. This category represents the child's ability to respond verbally. Digit Span, Coding, and Picture Arrangement composed the Sequential category. These subtests purportedly tap one's ability to process short-term memory items and storages of auditory and visual stimuli. Bannatyne (1968) suggested that this tripartite recategorization of WISC subtests possessed greater psychological meaning and diagnostic utility than the more traditional Verbal versus Performance dichotomy. Bannatyne's (1968) sample (dyslexic children) obtained highest scores on the Spatial, lowest scores in Sequential, with Conceptual scores being in the middle.

Rugel (1974) refined Bannatyne's work and added significantly to the recategorization of WISC scores. Rugel (1974) reviewed 25 published articles on reading disabled children which reported WISC subtest scaled scores. Rugel (1974) then recategorized the reported WISC subtest scaled scores into Spatial, Conceptual, and Sequential. The results supported Bannatyne's predicated ordering of the three categories. There was a clear and statistically reliable tendency for the Spatial to be ranked highest and Sequential lowest with Conceptual in the middle. Rugel's study was important because his findings suggest a broader potential application of Bannatyne's recategorization, and extended to a much broader base of learning disabled children than was originally considered. In addition, Rugel cited factor analytic work which supported his findings and applied the factor analysis to interpretation of the categories.

This was significant because it led to Bannatyne's (1974) decision to drop the Picture Arrangement subtest from the Sequential category, and to replace it with the Arithmetic subtest. Bannatyne (1974) followed Rugel's (1974) suggestion and added a fourth category consisting of Information, Arithmetic, and Vocabulary subtests. Factor analytic research on the WISC by various investigators generally supported Bannatyne's suggested recategorization scheme.

With the appearance of the WISC-R, the utility of Bannatyne's recategorization scores for learning disabled children became an empirical issue. However, since the factor structure of the WISC-R (Kaufman, 1975) is essentially the same as the WISC, then perhaps Bannatyne's recategorization should retain its utility. Smith, Coleman, Dokecki, and Davis (1977b) investigated the utility of Bannatyne's recategorization of WISC-R subtest scaled scores obtained from 208 schools verified learning disabled children. Their results suggest that school verified learning disabled children are characterized by the same pattern of abilities that Bannatyne (1968, 1971) found for children with genetic dyslexia and that Rugel (1974) reported for disabled readers in general. The question left unanswered by Smith et al., i.e., . . . "does a pattern of elevated Spatial and relatively depressed Sequential recategorized scores predict severe reading disabilities and learning disabilities, overall IQ notwithstanding?" (p. 442).

An interesting profile paradigm of the WISC-R scale scores for reading disabled children was found by Vance, Wallbrown, and Blaha (1979a). Five meaningful profiles were obtained and each of the five profiles was used to define a specific syndrome: Distractability, Perceptual Organization,

Language Disability Automatic, Language Disability Pervasive, and Behavior Comprehension. Suggested remediation procedures which were supported by data were presented for each profile. Based on Vance et al. (1979a), there is a likelihood that a number of different WISC-R profiles can exist for learning disabled and reading disabled children.

In an attempt to refine and replicate Smith et al. (1976b), Vance and Singer (1979b) analyzed the WISC-R scaled scores of 98 learning disabled children to see if Bannatyne's recategorization paradigm could be reproduced. The Vance et al. (1979) study differed from Smith et al. (1977b) works in that all 12 subtests of the WISC-R were included in the data analysis. In addition, a fifth category was added--Distractability. The Distractability category was composed of the sum of the Arithmetic, Digit Span, Coding, and Male scaled scores. Findings from the Vance et al. (1979b) investigation replicated to a degree the Smith et al. work in regard to a specific profile. The findings of Vance and Singer (1979b) did not add further evidence to the mounting data which suggests that a unique profile of WISC-R subtest scores might exist for learning disabled children. Bannatyne's pattern of recategorization of WISC scores, however, has been proven to be stable over time (Smith, 1978) and that socioeconomic status was not a confounding variable (Zingale & Smith, 1978) in regard to obtaining the specific subtest pattern.

Results of other studies are discouraging since they failed to identify a single clear-cut pattern of WISC/WISC-R subtest scaled scores for reading disabled or learning disabled. For example, the results of a study by Ackerman, Peters, and Dykman (1971) led them to conclude: ". . . there are no, so far as the authors can determine, characteristic

WISC patterns which can single children with learning disabilities out of a school population" (p. 163). Huelsman (1970) reached a similar conclusion on the basis of his own findings plus a scholarly comprehensive review of the literature: ". . . at this point research should be directed toward defining the possible significance of difference on WISC scores rather than toward pattern identification which seems relatively useless" (p. 549).

Gutkin (1979) investigated the measurement properties and practical utility of Bannatyne's recategorized WISC-R scores for 53 Caucasian and 87 Mexican-American children verified as learning disabled. Analysis of the recategorized scores of Caucasian learning disabled children was characterized by the spatial, conceptual, sequential pattern which was predicted by Bannatyne. The same pattern was not found to be true for a group of Mexican-American learning disabled children. However, recategorized scores obtained by each individual child in the Caucasian and Mexican-American failed to demonstrate the Spatial, Conceptual, Sequential pattern. The findings of Gutkin's (1979) research "calls into serious doubt the efficiency of using the Bannatyne recategorized scores for the purposes of diagnosing individual children as learning disabled" (p. 182). The practical utilization of this information is important to clinicians because it is important to know that learning disabled children, similar to the ones in these samples, possess relatively good spatial skills, adequate verbal-conceptual skills, weak sequential skills, and deficient skills on tasks involving concentration and attention for a specific period of time.

The relative utility of using WISC-R profiles for generating hypothesis

testing are important. However, within each diagnostic group there may be different profile patterns (Vance et al., 1979a). Kaufman's (1979) contention that ". . . we need to approach each individual profile as a specific interpretative challenge, to be understood in the context of the child's particular background and test behavior" (p. 19) is well worth remembering. In addition, we must become familiar with knowledge concerning psychological and educational theories of development and learning so that we can be in a better position to interpret data for each individual child instead of looking for armchair diagnosis.

White (1979) provides further guidelines for practitioners to determine the minimum differences in scaled score points needed for statistical significance when applying Bannatyne recategorization of the WISC-R subtests on an individual basis. According to White (1979), ". . . if the sequence from high to low is Spatial-Conceptual-Sequential and the difference between each two categories is at least two scaled score points, the pattern may be considered to match that of most disabled learners" (p. 177). In addition, this author suggests that the practitioners also include the Acquired Knowledge and Distractability categories in their analysis. However, these differences should be evaluated or interpreted in terms of factor analytic dimensions of the WISC-R. If there are significant differences between the categories based on White's (1979) guidelines, then the clinician could view the differences as meaningful dimensions of cognitive abilities.

The relative usefulness of an alleged diagnostic utility of the WISC-R subtest score pattern is highly questionable. What is needed is careful systematic research as to why certain groups of children or

individual children manifest certain weaknesses or strengths on the WISC-R or diagnostic tests. Research should be directed toward defining or attempting to understand the implications that the WISC-R subtests have for the learning process itself. By identifying patterns of strengths and weaknesses within the psychological and educational dimensions, valuable directions can be provided to those working with exceptional children. Utilization of the results from the WISC-R in this manner may provide valuable direction for educational/instructional program planning, vocational program planning, and counseling through increasing the usefulness of the WISC-R as a diagnostic and planning instrument for children and youth.

Research should be directed toward why certain groups of children perform in the manner in which they do on subtests of the WISC-R. Issues which could be investigated would be sex differences of learning disabled children on WISC-R subtests, the effects of differential education and training (curriculum) programs and longitudinal remediation programs based on ability profiles from the WISC-R. This author does not recommend the use of profile analysis based solely on WISC-R scores for the main criteria for diagnosing learning disabled children.

Emotional Disturbance

The WISC-R like its predecessor the WISC appears to be a reliable and stable instrument in evaluating emotionally disturbed children. Various attempts were made with the WISC to determine whether subtest scores and scales reveal any characteristic patterns that can differentiate emotionally disturbed children from other groups of children. These attempts were not successful. According to Sattler, ". . . findings

on the WISC indicate generally that no systematic pattern appears that can distinguish children with generalized emotional disturbance, or specific form of emotional disturbance from normal children or from children with other forms of psychopathology" (Sattler, 1974, p. 328). In addition, the works of Henning and Levy (1967) and Camp (1966) indicated that just because there might be a Verbal-Performance discrepancy in favor of the Performance Scale appearing in samples of delinquent children, does not mean that this pattern should be used as a diagnostic sign of delinquency. In fact, a Verbal < Performance or Performance < Verbal discrepancy, which might in part indicate a reduction in verbal or performance functioning, may be related to many factors such as educational retardation, learning disorder, minority background, artifact of the WISC-R, or it may not be related to any particular difficulty. The best predictors of emotional disturbance are often those behaviors which are elicited during testing. Behaviors which are displayed during testing along with reality testing attitude and verbal responses provide the psychologist with much more valid data for making hypotheses regarding the diagnosis of emotional disturbance.

Hamm and Evans (1978) investigated WISC-R subtest patterns for severely emotionally disturbed students and found that the ". . . systematic patterns of performance alone did not appear which would distinguish emotionally disturbed children from normal children" (p. 190). Dean (1978) tried to distinguish learning disabled and emotionally disturbed children by their performance on the WISC-R. His results did not support a specific pattern characteristic of learning disability or emotional disturbance. However, the results of his study suffer because of two major methodological

problems (Sattler, 1979, in press). First, he based his conclusions on a between-group comparison (learning disabled vs. emotionally disturbed) instead of a within-group analysis. A second problem concerns the selection of appropriate comparison groups, thereby restricting the generalizability of his findings. Again, no specific diagnostic pattern could be justified based on Dean's work. Much work is needed in understanding the cognitive difficulties of the heterogenous group of children labeled as learning disabled and emotionally disturbed. It will not come about simply by comparing WISC-R scores of learning disabled or emotionally disturbed with those of other types of children. Carefully designed subgroups must first be established within larger groups of learning disabled or emotionally disturbed. Then a study of their performance on a variety of instruments could prove helpful in understanding the cognitive abilities of these children and youth.

Interpreting WISC-R Subtest Differences

Verbal-Performance differences on the WISC-R and subtest scatter have frequently been associated with the diagnosis of a learning disability. Vance, Gaynor, and Coleman's (1976) investigation of learning disabled children's performance on the WISC-R did not find significant scatter between the Verbal-Performance IQ and suggested that the Verbal-Performance discrepancy is not a valid index in the diagnosis of learning disability. Kaufman (1976a) presented norms whereby a practitioner would be better able to interpret WISC-R discrepancy scores. In this study on Verbal-Performance IQ difference, Kaufman (1976a) found ". . . that about half of the children in the standardization sample had discrepancies of 9 or more points, about one-third had discrepancies of 15 or more IQ points" (p. 741).

In addition, Verbal < Performance and Performance < Verbal occurred equally. These differences held constant for age, sex, and race. Regarding these figures concerning normal WISC-R Verbal-Performance discrepancies, many practitioners may interpret significant differences when in actuality there would not be any for the individual child. Kaufman (1976a) suggested that the keys to interpreting Verbal-Performance discrepancies and determining classification are frequency of occurrence and the use of a nominative approach based on his percentage distributions (p. 743). In other words, normal children will exhibit as much scatter in their profiles as do exceptional children.

Anderson, Kaufman, and Kaufman (1976) investigated the performance of 41 learning disabled children on the WISC-R. They concluded that their learning disabled sample did not have unusually large discrepancy. In other words, one could obtain significant differences between Verbal-Performance IQs but this statistical difference may be just an artifact of the test or normal fluctuations. In another study, Kaufman (1976b) suggested a unique approach to the interpretation of test scatter on the WISC-R. His (1976b) article provides the clinician with a solid framework to help guide their interpretation of test scatter. He developed norms (Tables 2 and 4, page 163, 165) for the scaled score ranges and for the number of deviant test scores obtained by children in standardization samples. These norms should allow the practitioner to move from the subjective faction of interpreting scatter to system based on normative data. However, clinical insight on the part of the psychologist should not be overlooked in interpreting test scores. According to Kaufman (1976b), ". . . the degree of WISC-R test scatter should not be used to corroborate a diagnosis of learning disabilities" (p. 167). In addition to Verbal vs.

Performance discrepancy on the WISC-R, subtest scatter should not be used to diagnose learning disabilities. How should we interpret test scatter? Perhaps it is worth summarizing Kaufman's (1976a) suggestion:

> When a child has an unusual amount of scatter in his WISC-R profile, there may be diagnostic and remedial implications. When there is some scatter but not abnormal amount, then the focus should be primarily--perhaps solely, on gaining a better understanding of the child's abilities and/or on planning for his remediation. (p. 167)

It is important for the psychologist to understand and/or to have knowledge of the amount of scatter in profiles of normal children as well as Verbal-Performance differences in order to interpret properly these discrepancies. For instance, on the normal standardization sample (2000 children) about one out of every three have intra-subtest differences (Kaufman, 1976b). It is common to observe significant differences between pairs of test scores in a child's (normal or exceptional) WISC-R protocol (Vance, Gaynor, & Coleman, 1976; Vance & Hankins, 1978; Vance, Wallbrown, McGee, & Engin, 1978).

How should one determine if an unusual amount of scatter exists? Kaufman's (1976b) procedure whereby the clinician would enter Table IV (page 165, Journal of Learning Disabilities, 1976) to determine if their specific WISC-R test protocol and obtained scale scores were unusual is recommended. If you use a 15% criterion level (less than 15% of the children would have these types of WISC-R significant subtest differences) in order for the subtest scores to be considered out of the ordinary or abnormal or significant at the 15% criterion level, then the following subtest score differences should occur: two tests deviating significantly from the regular Verbal Scale, three from the regular Performance and four from the regular Full Scale (Kaufman, 1976b). In other words, a diagnosis

of emotional disturbance or a learning disability cannot be based solely on WISC-R test scores. In all of the articles reviewed for this study this author does not find any evidence which would lead to the conclusion that one could differentiate emotionally disturbed children, learning disabled children, and youth from their normal peer group based solely on psychological test (WISC-R) results.

Conclusion

This paper does not wish to take away the importance of scatter or Verbal-Performance discrepancies, but only to serve as a caution against the use of "armchair analysis" of these indices. It is important to know that a child performs better either verbally or perceptually. These differences within and between scale scores on the WISC-R tells us much about a child's abilities. In addition, careful analysis of each individual child's results on the WISC-R could lead to identification of major strength or weakness which would be important for those professionals working with him or her.

We need to approach each child's test results, whether on the WISC-R or other standardized tests or behavior observation, as a challenge and not rely on a profile or computer printout or any other form of armchair analysis. Behaviors diagnose, not test scores. We need to know and understand the normative properties of inter-scatter and Verbal-Performance discrepancies for the WISC-R in order to provide meaningful interpreted data to our constituents.

The relative usefulness of alleged diagnostic utility of the WISC-R subtest score pattern (profile) for any psychopathological group is very questionable. What is needed is careful systematic research as to why

certain groups of children or individual children manifest certain weaknesses or strengths on the WISC-R or other standardized tests. Research should be directed toward defining or attempting to understand the implications that the WISC-R subtests have for the learning process. By identifying patterns of strengths and weaknesses within the psychological and educational domains, valuable directions can be provided for those working with children, exceptional or not. Utilization of the results from the WISC-R in this manner may provide valuable directions for educational/instructional program planning, vocational planning, thus increasing the usefulness of the WISC-R.

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